

Course Title: Precalculus

Topic/Concept: Functions

Time Allotment: 5 weeks

Unit Sequence: 1

Major Concepts to be learned:

1. Functions
2. Transformations of graphs of relations
3. Inverses of functions

Expected Skills to be demonstrated:

1. Identify a relation as a function or one-to-one function
2. State the domain and range of a function
3. Express as relation using a table, graph, list, equation, or mapping
4. Identify rigid and non-rigid transformations of a function
5. Combine functions using arithmetic or composition
6. Write the equation of a line, in slope intercept or general forms, given two points or a point and the slope
7. Calculate the slope of a line

PA Standards/Anchors:

Eligible Content:

2.8.11.B,D,E,F

Instructional Strategies:

Assessments:

Problem solving activities
Lecture
Note Taking

- Tests

Course Title: Precalculus

Topic/Concept: Algebraic Functions

Time Allotment: 4 Weeks

Unit Sequence: 2

Major Concepts to be learned:

1. The Fundamental Theorem of Algebra
2. Zeros of a polynomial correspond to factors
3. Asymptotes

Expected Skills to be demonstrated:

1. Solve a quadratic equation using factoring, completing the square, or the quadratic formula
2. Graph a quadratic equation
3. Be able to convert between vertex and standard forms of a quadratic equation
4. State and apply the Fundamental Theorem of Algebra
5. Find complex zeros of polynomial functions by factoring
6. Write a polynomial function given its complex factors
7. Perform arithmetic involving imaginary numbers
8. Plot a imaginary number on the complex plane
9. Identify the features of a rational function including asymptotes, holes, zeros, and end behavior

PA Standards/Anchors:

Eligible Content:

2.8.11.B,D,E,F	N/A
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Instructional Strategies:

Assessments:

Problem solving activities Lecture Note Taking	<ul style="list-style-type: none">• Test
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Course Title: Precalculus

Topic/Concept: Exponential and Logarithmic Functions

Time Allotment: 3 Wks

Unit Sequence: 3

Major Concepts to be learned:

1. Exponential functions model situations involving a constant rate of change
2. Logarithmic functions are the inverses of exponential functions

Expected Skills to be demonstrated:

1. Sketch the graphs of exponential and logarithmic functions
2. Solve exponential and logarithmic equations
3. Use exponential growth and decay models to solve problems

PA Standards/Anchors:

Eligible Content:

2.8.11.B,D,E,F

N/A

Instructional Strategies:

Assessments:

Problem solving activities
Lecture
Note Taking

- Test

Course Title: Precalculus

Topic/Concept: Trigonometry

Time Allotment: 11 weeks

Unit Sequence: 4

Major Concepts to be learned:

1. Trigonometric functions are used to model situations that do not involve triangles
2. The unit circle
3. The radian as a way to measure angle

Expected Skills to be demonstrated:

1. Convert between radians and degrees
2. Determine the trig function of a "special" angle using the unit circle
3. Find the reference angle of a given angle
4. Identify coterminal angles
5. Graph a sinusoidal function
6. Model a physical situation using a sinusoidal function
7. Use inverse trig functions to solve trigonometric equations
8. Solve right and oblique triangles using trig functions, the law of sines and the law of cosines
9. Find the area of any triangle

PA Standards/Anchors:

Eligible Content:

2.8.11.B,D,E,F
2.10.11.A,B

N/A

Instructional Strategies:

Assessments:

Problem solving activities
Lecture
Note Taking

- Tests

Course Title: Precalculus

Topic/Concept: Conic Sections

Time Allotment: 2 Wks

Unit Sequence: 5

Major Concepts to be learned:

1. Eccentricity of conic sections.
2. Graphical interpretation of conic sections.
3. Algebraic recognition of conic sections.

Expected Skills to be demonstrated:

1. Identify a second degree equation as either a parabola, circle, ellipse, or hyperbola.
2. Convert a conic section between general and standard forms.
3. Graph a conic section.
4. Write the equation for a conic section given its graph.

PA Standards/Anchors:

Eligible Content:

N/A

N/A

Instructional Strategies:

Assessments:

Problem solving activities
Lecture
Note Taking

- Test

Course Title: Precalculus

Topic/Concept: Probability

Time Allotment: 2 Wks

Unit Sequence: 6

Major Concepts to be learned:

1. What probability is.
2. How counting techniques relate to probability calculation.

Expected Skills to be demonstrated:

1. Select and apply appropriate counting techniques (counting principle, combinations, permutations) given a scenario.
2. Calculate probability/odds using counting techniques and other probability principles (counting principle for probability; conditional probability; “and,” “or,” “then” probabilities; binomial experiments).

PA Standards/Anchors:

Eligible Content:

2.7.11.A,C

N/A

Instructional Strategies:

Assessments:

Problem solving activities
Lecture
Note Taking

- Test

Course Title: Precalculus

Topic/Concept: Intro to Calculus

Time Allotment: 11 weeks

Unit Sequence: 7

Major Concepts to be learned:

1. The limit
2. The derivative
3. The definite integral

Expected Skills to be demonstrated:

1. Evaluate limits
2. Differentiate using the power, product, quotient, and chain rules
3. Antidifferentiate using the power rule
4. Integrate numerically using upper, lower, and midpoint sums as well as the trapezoid method.
5. Evaluate definite integrals using the Fundamental Theorem of Calculus

PA Standards/Anchors:

Eligible Content:

2.11.11.A,B,C

N/A

Instructional Strategies:

Assessments:

Problem solving activities
Lecture
Note Taking

- Tests